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## Computer systems to facilitating organizational learning: IT and organizational context

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### Abstract

A comprehensive model that delineates the interrelationships among computer systems, organizational context and organizational learning is absent. This study aims to fill this void. Unlike previous research, this study investigates the role of computer systems, i.e. organizational learning computer systems (OLCS), in facilitating organizational learning. In our framework, we argued that contextual variables mediated the impact of OLCS on organizational learning. In order to test the feasibility of this framework, we conducted an empirical study. This study employed a survey instrument, which contained data collected from 500 organizations in manufacturing, service industry, and academic institutions. A total of 165 usable responses were analyzed. The results indicate that OLCS have a positive impact on the organizational learning processes. Both ‘problem characteristic’ and ‘organizational culture’ moderate the influence of OLCS on organizational learning. The implications of the study are provided, and future research is suggested.

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*Keywords:* Organizational learning computer systems; Organizational context; Organizational learning

### 1. Background

A comprehensive framework concerning organizational learning has been proposed by Huber (1991). This framework identified four constructs, which are crucial to the effectiveness of organizational learning; they are knowledge acquisition, information distribution, information interpretation, and organizational memory. Since Huber’s comprehensive view of organizational learning theory was published, at least four researchers have referenced this framework in conducting related studies (Goodman & Darr, 1998; Hernes, 1999; Nonaka & Takeuchi, 1995; Robey, Boudreau, & Rose, 2000). However, other researchers criticized that Huber’s framework did not examine the role of computer systems for acquiring knowledge and enhancing the effect of organizational learning. They have proved that computer systems are changing many organizational processes including communication (Kiesler & Sproull, 1987), group decision making (Kiesler, Siegel, & McGuire,

1984), coordination (Rice & Shook, 1990), and collaborative work (Kraut, Galegher, Fish, & Chalfonte, 1992). Despite previously mentioned criticism, there are relatively few field studies that examine the effect of computer systems on facilitating organizational learning (Constant, Sproull, & Kiesler, 1996; Goodman & Darr, 1998; Orlikowski, 1993a).

Orlikowski (1993b) argued that ‘organizational context’, such as corporate strategies and structure and culture, is one of the critical factors that influence the adoption and using of IT. A similar concept was presented in Orlikowski (1993a), which reveals that a number of organizational elements, such as mental models (which affect how people understand and appreciate IT) and structural properties (reward systems and workplace norms), significantly influence the implementation and usage of IT. Although several researchers (Dutton & Dukerich, 1991; Henderson & Clark, 1990; Orlikowski, 1993a,b) have investigated the impact of organizational context on the applicability of IT in an organization, there are relatively few empirical studies that examine the role of organizational context, which serves as a moderator between IT and organizational learning. The purposes of this study are: (a) to examine

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the role of computer system in facilitating organizational learning; (b) to realize the impact of organizational context on the effect of adopting OLCS to facilitate organizational learning.

### 1.1. Conceptual framework

Many definitions of organizational learning have been proposed. For example, [Argyris \(1993\)](#) emphasized that organizational learning is a process of detecting and correcting errors. Similarly, [Fiol and Lyles \(1985\)](#) claimed that organizational learning contains the procedures to improve actions through knowledge acquisition and creation. [Huber \(1991\)](#) argued that organization learns through its process of information. He proposed an organizational learning framework, which contained four constructs: knowledge acquisition, information distribution, information interpretation, and organizational memory. [Goodman and Darr \(1998\)](#) employed Huber's framework and argued that organizational level learning occurred when the problem-solution exchanges and consequences were communicated and known by other organizational members (*broadcasting*). As [Brown and Duguid's \(1991\)](#) research indicated, in order to have significant learning and innovation in the informal communities-of-practice in which they work, it is necessary to have a mechanism for organizations to share their interpretation about the problem-solving exchanges and to update the organizational memory about their experiences (*updates*). [Walsh and Ungson's \(1991\)](#) research indicated that there was some form of organizational memory storing problem-solution exchanges and consequences. The basic processes that contribute to the occurrence, breadth, and depth of organizational learning depend on organizational memory (*memory*) ([Huber, 1991](#)). Since the system with the aforementioned functions (*broadcasting, updates, and memory*) may have great impact on the organizational learning, we call this type of system 'organizational learning computer system (OLCS)'.

The organizational context also plays a critical role in affecting technology and learning processes ([Goodhue & Thompson, 1995](#); [Tyre & Orlikowski, 1994](#)). Contextual variables can be viewed as increasing or decreasing the effect of OLCS on organizational learning processes. A wide variety of organizational variables have been proposed, such as rewards systems, performance measure, problem-solution characteristics ([Goodman & Darr, 1998](#)), corporate strategies, structure, culture ([Goodman & Darr, 1998](#); [Orlikowski, 1993b](#)), trust ([Scott, 2000](#)), and management style ([Nonaka & Takeuchi, 1995](#)). A culture of collaboration and mutual trust should facilitate the role of OLCS and organizational learning. However, organizations with a conservative culture and bureaucratic structure should substantially reduce the propensity to exchange problems and solutions. Further, the nature and complexity of the task structure will influence the form of problems and

solutions to be exchanged. Multiple attributes are needed to describe a complex problem and the environmental conditions surrounding it. Also, for complex problems, there are many possible solutions and applicable rules to implement those specific solutions. Therefore, it is usually more difficult to formulate and deliver complex solutions for those contributors. On the other hand, when the problem statement has few attributes and there is only one solution with few implementation rules, problem-solution exchanges should be easy. Given the unclear functions of OLCS in facilitating organizational learning, and the unspecified effect of mediating organizational context on the impact of OLCS on organizational learning, we therefore conducted our research accordingly.

## 2. Research methodology

In order to explore the impact of OLCS and organizational context on organizational learning, we developed the research framework in [Fig. 1](#). There are two research questions. (a) Does OLCS play a role in facilitating organizational learning? (b) What types of organizational context may moderate the effect of OLCS on facilitating organizational learning?

The research design of this research contains the following issues.

1. *Purpose*. The purpose of this research is 'hypotheses testing'. In order to do so, we conducted a study that contained both correlational and causal study. The causal study was conducted to verify the relationship between OLCS and the organizational learning process. The other question that we wanted to investigate was the effect of organizational context. In our research, organizational context served as a moderator. Since contextual variables can be viewed as increasing or decreasing the costs inherent in the decision to contribute or to adopt knowledge, we examined the effect of the moderator between OLCS and the organizational learning process.

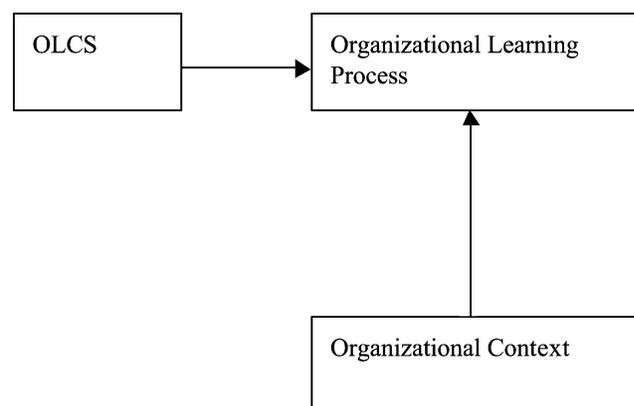


Fig. 1. Research framework.

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